II. Remarks

Support for the various amendments made to the claims herein may be found throughout the application as filed.

On September 19, 2008, an Office Action (hereafter "Office Action") was mailed rejecting all of the then-pending claims. On December 18, 2008, the Examiner and the applicants' attorney conducted a telephone interview, wherein no agreement concerning the patentability of the claims as they were presented previously, or as they are presented herein, was reached. Applicant's attorney thanks the Examiner for taking the time and effort to conduct the interview.

The present Response and Amendment are submitted herewith in response to the Office Action, and as a follow-up to the interview.

Applicants respectfully request entry of the amendments made herein, and examination and allowance of the claims as amended herein.

III. Rejections of Claims Made in the Office Action

In the Office Action mailed September 19, 2008, the Examiner objected to and rejected claims on the following bases:

(A) Claims 1-15 were objected to due to informalities;

(B) Claims 1, 4, 6-10, 13-16, 18-21 were rejected as being anticipated by US Pat. No. 5,329,111 to Sonoda et al. (hereafter "the Sonoda reference") under 35 U.S.C. 102(b);

(C) Claims 2-3, 11-12 were rejected as being unpatentable over the Sonoda reference in view of US Pat. No. 5,502,488 to Nagasaki (hereafter "the Nagasaki reference") further in view of US Pat. No. 5,508,507 to Nelson et al. (hereafter "the Nelson reference") under 35 U.S.C. 103(a);

(D) Claim 5 was rejected as being unpatentable over the Sonoda reference under 35 U.S.C. 103(a); and

(E) Claim 17 was rejected as being unpatentable le over the Sonoda reference in view of the Nagasaki reference under 35 U.S.C. 103(a).

The foregoing objection and rejections are responded to below, where each response references the letter corresponding to each objection or rejection set forth above.

IV. Responses to Objection and Rejections Made in the Office Action

(A) Claims 1 through 15 as amended herein overcome the objections made thereto.

Claims 1 and 9 as amended herein overcome all the objections made to claim 1-15.

(B) Claims 1, 4, 6-10, 13-16, and 18-21 as amended herein are not anticipated by the Sonoda reference under 35 U.S.C. 102(b).

In the Response to Arguments section of the Office Action, the Examiner stated:

> The Examiner considers that Sonoda et al. does disclose "a color sensor circuit . . . corresponding to an intensity of said color component occurring under current operating conditions." Sonoda et al. discloses output voltages corresponding to color signals R, G and B are outputted from image sensor 1 via amplifiers 2, 3, 4, which occurs at a temperature of surrounding area or environment such as a room temperature, which corresponds to *current operating conditions*, figure 7, column 1, lines 10-67.

The above argument does not take into account the clear and unambiguous limitations of the claims as they are amended herein. ***The Sonoda reference simply does not disclose compensating for dark current voltage offsets according to current operating temperatures, and instead, as discussed in detail above, discloses using predetermined values that represent dark voltages.***

In rejecting claims 1, 4, 6-10, 13-16 and 18-21 as being anticipated by the Sonoda reference under 35 U.S.C. 102(b), the Examiner stated:

> Regarding claim 1, Sonoda et al. discloses a color sensing circuit, comprising:
>
> a color sensor circuit configured to provide a light photocurrent from a color component of a light input, said color sensor circuit being configured to provide a first output voltage corresponding to an intensity of said color component ***occurring under current operating conditions (Sonoda et al. discloses output voltages corresponding to color signals R, G, B are outputted from image sensor 1 via amplifiers 2, 3, 4, and***

entered differential amplification circuits 8, 9, 10 via resistors 8d, 9d, 10d; which occurs at a temperature of surrounding area or environment such as a room temperature (under current operating conditions), figure 7, column 1, lines 10-67);

a dark color sensor circuit configured to provide a dark photocurrent proportional to said current operating conditions (noted that an output voltage which represents the color temperature of a light source is depend upon room temperature, which corresponds to current operating conditions) and output a second output voltage ***corresponding to an offset voltage generated by said dark photocurrent under current operating conditions*** (dark voltage corresponds with R color signal is hold in sample hold circuit 5, the dark voltage is entered differential amplification circuit 8 via resistor 8c, figure 7, column 1, lines 10-67);

a differential amplifier circuit (differential amplification circuit 8, figure 7, column 1, lines 10-67) operably coupled to said color sensor circuit and to said dark color sensor circuit, said differential amplifier circuit being configured to receive said first and second output voltages, remove, using said second output voltage, said dark color offset voltage from said first output voltage, and thereby provide a dark color offset voltage and current operating condition compensated output signal to a differential output thereof representative of said intensity of said color component.

Regarding claims 4, 10, Sonoda et al. discloses wherein said differential amplifier circuit comprises:

a difference amplifier (differential amplifier 8a, figure 7, column 1, lines 10-67) configured to provide said compensated output signal to said differential output and further comprising a positive input, and a negative input;

a feedback resistor (resistor 8b, figure 7, column 1, lines 47-67) having a resistor value with one end coupled to said negative input and another end coupled to said differential output;

a first resistor (resistor 8d, figure 7) having said resistor value coupled in series with a color sensor output configured to provide said first output voltage and said negative input;

a second resistor (resistor 8c, figure 7) having said resistor value coupled in series with a dark sensor output of said dark sensor circuit configured to provide said second output voltage and said positive voltage;

a third resistor (resistor 8e, figure 7) having said resistor value coupled in series to said positive input and to ground.

Regarding claims 6, 13, 19, Sonoda et al. discloses wherein said color component comprises red (figures 6-7, column 1, lines 10-67).

Regarding claims 7, 14, 20, Sonoda et al. discloses wherein said color component comprises green (figures 6-7, column 1, lines 10-67).

Regarding claims 8, 15, 21, Sonoda et al. discloses wherein said color component comprises blue (figures 6-7, column 1, lines 10-67).

Regarding claim 9, Sonoda et al. discloses a color sensing circuit comprising:

a plurality of color sensor circuits, each color sensor circuit being configured to provide a light photocurrent from a color component of light input corresponding thereto, and to output a first output voltage corresponding to an intensity of said color component corresponding thereto that occurs under current operating conditions (voltage indicating intensity of R color signal outputted from amplifier 2 and entered differential amplification circuit 8; voltage indicating intensity of G color signal outputted from amplifier 3 and entered differential amplification circuit 9; voltage indicating intensity of B color signal outputted from amplifier 4 and entered differential amplification circuit 10; the image sensor 1 output these output voltages at a temperature of surrounding area or environment such as a room temperature (current operating conditions), figure 7, column 1, lines 10-67);

a dark color sensor circuit configured to provide a dark photocurrent proportional to said current operating conditions (noted that an output voltage which represents the color temperature of a light source is depend upon room temperature) and output a second voltage corresponding to an offset voltage generated by said dark photocurrent under said current operating conditions (dark voltage corresponds with R color signal is hold in sample hold circuit 5, the dark voltage is entered differential amplification circuit 8 via resistor 8c, figure 7, column 1, lines 10-67);

at least one differential amplifier circuit (differential amplification circuit 8, figure 7, column 1, lines 10-67) operably coupled to said plurality of color sensor circuits and to said dark color sensor circuit and being configured to receive said first and

second output voltages, remove, using said second output voltage, said dark color offset voltage from each of said first output voltages, and provide dark color offset voltage and current operating condition compensated output signals corresponding to each of said color components to at least one differential output thereof, each of said output signals representing said intensity of said color component corresponding thereto.

As for claim 16, claim 16 is a method claim of apparatus claim 1. Therefore, see Examiner's comments regarding claim 1.

As for claim 18, see Examiner's comments regarding claim 9.

Figure 7 and selected portions of the Sonoda reference cited by the Examiner are reproduced hereinbelow.

Abstract

An image input device photoelectrically reads a document and outputs digital data. This image reader includes a first voltage generating circuit for generating a first voltage for setting an upper limit of contrast, a second voltage generating circuit for generating a second voltage for setting a lower limit of contrast, and an A/D converter for converting an input analog signal to a digital signal in accordance with the first and second voltages. At least one of the voltages generated by the first voltage generating circuit and second voltage generating circuit is variable. ***Also disclosed is an image reader including a dark voltage memory circuit, storing dark voltages corresponding to color signals R, G and B, a first switching circuit sequentially switching the output of the dark voltage memory circuit and outputting a selected dark voltage, a second switching circuit adapted to synchronously output a selected color signal corresponding to the selected dark voltage, and a differential amplifier subtracting the selected dark voltage from said selected color signal.*** *Abstract, U.S. Patent No. 5,329,111 to Sonoda et al. [Emphasis added.]*

BACKGROUND OF THE INVENTION

An image reader which reads a printed image and converts it to an electric signal is known. Such a device is provided with a contrast adjusting function with which the user may freely control contrast to obtain the optimum picture according to the original. Thus, as illustrated in FIG. 6, color signals R, G and B from an image sensor 1 are amplified by amplifying circuits 2, 3 and 4 and sequentially switched by a selection circuit 11 which is supplied with a switching signal from a device not shown.

Referring to FIG. 7, which is a specific embodiment of FIG. 6, the image sensor 1 outputs color signals R, G and B which are then independently amplified by amplifiers 2 to 4.

Taking the R signal as an example, FIG. 10(a) shows the waveform of the output signal from the amplifier 2 which is obtained when the picture elements of the image sensor 1 are sequentially scanned. In the image sensor 1, the plural picture elements in the first scanning area and those in the last scanning area constitute unused areas which are not used in the reading of a document. Thus, the areas T1 and T3 in FIG. 10(a) represent unused picture elements and the area T2, exclusive of these areas, represents effective picture elements exposed to light. As seen from FIG. 10(a), the output voltage of the area not exposed to light is a dark voltage, which is lower than the output voltage of the effective picture elements. ***Representative of this dark voltage, a predetermined value, for example a value found by averaging, is memorized by a sample hold circuit 5 in response to a timing signal from a circuit not shown, and the signal shown in FIG. 10(b) is output. The output signal of the sample hold circuit 5 and the output signal of the amplifier 2 are differentially amplified in a different amplification circuit 8. As a result, a signal available on subtraction of the dark voltage from the R signal is finally output as shown in FIG. 10(c).***

The same applies to G and B signals, as shown in FIG. 7. Thus, the dark voltages of the respective color signals are memorized in sample hold circuits 6, 7, respectively, and subtracted from the color signals in differential amplification circuits 9, 10. The differential amplification circuit 8 comprises a differential amplifier 8a and resistors 8b through 8e, differential amplification circuit 9 comprises a differential amplifier 9a and resistors 9b through 9e, and differential amplification circuits 10 comprises

a differential amplifier 10a and resistors 10b through 10e.

The output signals from the differential amplification circuits 8 through 10 are fed to a selection circuit 11, from which they are output in synchronism with selection signals supplied from a circuit not shown and converted to digital signals by and A/D converter 17.

The analog signal output of the selection circuit 11 is amplified by an amplifying circuit 12 with a gain predetermined according to a variable resistor 13 and converted to a digital signal in bits from a most significant bit (MSB) to a least significant bit (LSB) by the A/D converter 17. This digital signal corresponds to the levels of reference voltages H and L from a reference voltage generator 14 and amplifiers 15 and 16. *Col. 1, lines 8-67 and col. 2, lines 1-2 of U.S. Patent No. 5,329,111 to Sonoda et al. [Emphasis added.]*

FIG. 7
PRIOR ART

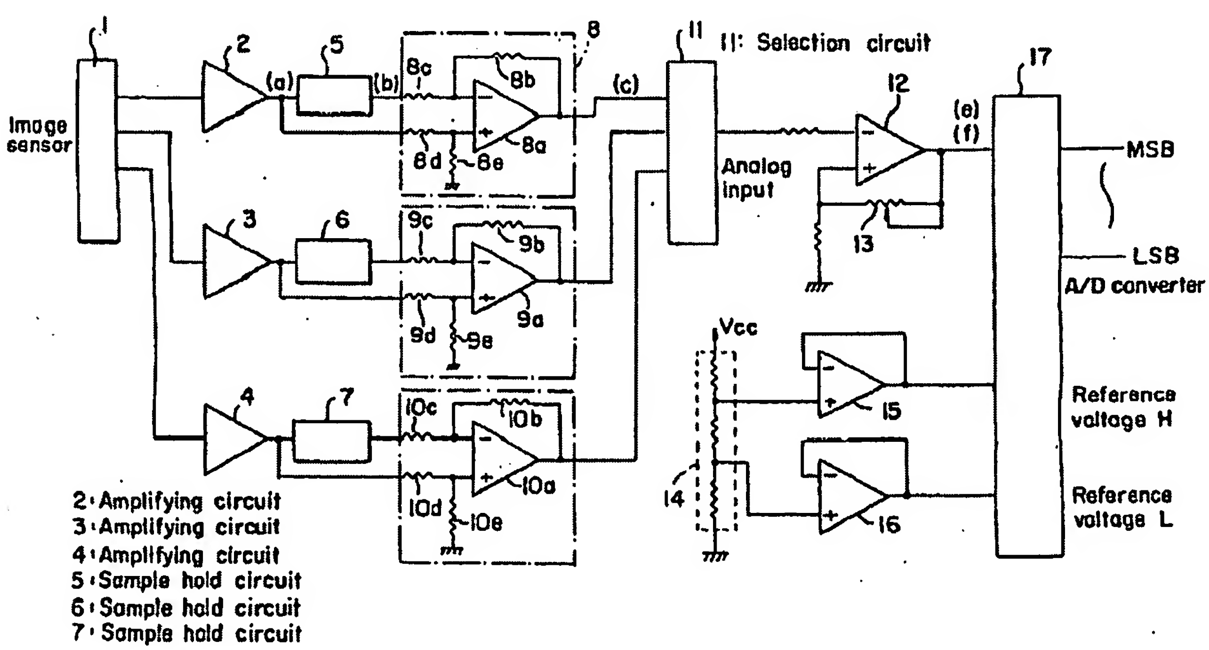


Fig. 7 of the Sonoda reference

The Examiner's arguments, and Inspection of the above-cited portions of the Sonoda reference, as well as other portions thereof, shows that the Sonoda reference discloses subtracting from color signals ***predetermined*** values that represent dark voltages. Contrary to the Examiner's repeated assertions, there is simply no discussion, hint at or suggestion of subtracting dark voltages from color signals where such dark voltages are based on measurements obtained ***under current operating temperatures at which a color sensing circuit is operating***. Likewise, there is no discussion, hint at or suggestion regarding the problems arising from fluctuations or variations of dark voltages with current operating temperatures, or compensating color signals for such fluctuations or variations. Accordingly, the Sonoda reference belies a total lack of awareness of the problems arising from fluctuations in dark voltages as current operating temperatures vary, let alone a solution to such problems.

While the Examiner asserts throughout the Office Action that the Sonoda reference does indeed disclose varying dark voltages in real time, and subtracting such dark voltages from R, G and B color signals, the Examiner provides no factual basis for such assertions other than pointing to the same figure (i.e., Fig. 7) and the same portions of text (i.e., col. 1, lines 10-67) as were referenced in the Final Office Action dated March 26, 2008. (Those portions of the Sonoda reference do not disclose the subject matter asserted by the Examiner to be disclosed therein, as is discussed in detail above.) Indeed, throughout these proceedings the Examiner ***has not responded in any manner*** to the specific assertions and specific support provided by the applicants' attorney for the argument that the Sonoda reference merely discloses subtracting from color signals ***predetermined*** values that represent dark voltages.

It is axiomatic that for a reference to anticipate a claim, all elements and limitations recited in the claims must be found within the four corners of such reference. Inspection of claims 1 through 21 as amended herein shows that all such claims include limitations and elements directed to measuring dark photocurrents ***under current operating temperatures*** at which a color sensing circuit is operating, and subtracting such dark color offset voltages from voltages corresponding to color components of light ***being measured at the same operating temperatures as the dark color offset voltages***. Such elements and limitations are not disclosed, hinted at or suggested anywhere in the Sonoda reference, and accordingly the Sonoda reference does not anticipate any of claims 1, 4, 6-10, 13-16, or 18- 21 as such claims are amended herein.

(C) Claims 2-3, and 11-12 as amended herein are not unpatentable over the Sonoda reference in view of the Nagasaki reference and further in view of the Nelson reference under 35 U.S.C. 103(a).

In rejecting claims 2-3, and 11-12 as being unpatentable over the Sonoda reference in view of the Nagasaki reference and further in view of the Nelson reference under 35 U.S.C. 103(a), the Examiner stated:

> Regarding claims 2-3, 11-12, Sonoda et al. fails to specifically disclose a sensor circuit comprise:
>
> a transimpedance amplifier including an output configured to provide said first output voltage, a negative input, and a positive input;
>
> a feedback resistor with one end coupled to said output and another end coupled to said negative input;
>
> a photodetector configured to detect said photocurrent of said color component and comprising a photodetector input coupled to ground and to said positive input, and a photodetector output coupled to said negative input.
>
> However, Nagasaki et al. discloses a circuit of one pixel of a solid-state imaging device which comprises photodiode 8, the output of the photodiode 8 coupled to the negative input of amplifier 11, the input of the photodiode 8 coupled to ground; the positive input of amplifier 11 coupled to ground; the amplifier 11 includes a feedback resistor (figure 16, column 6, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by the teaching of Nagasaki et al. in order to provide a current-voltage converting circuit, which assures sufficient output voltage.
>
> Sonoda et al. and Nagasaki et al. fail to specifically disclose a compensation capacitor coupled in parallel with said feedback resistor to said output and said negative input. However, Nelson et al. teaches a combination circuit 51, which includes a compensation capacitor 56, a feedback resistor 54 and operational amplifier 52 (figure 3, column 11, lines 27-36). Therefore, it would have been obvious to one of ordinary skill in

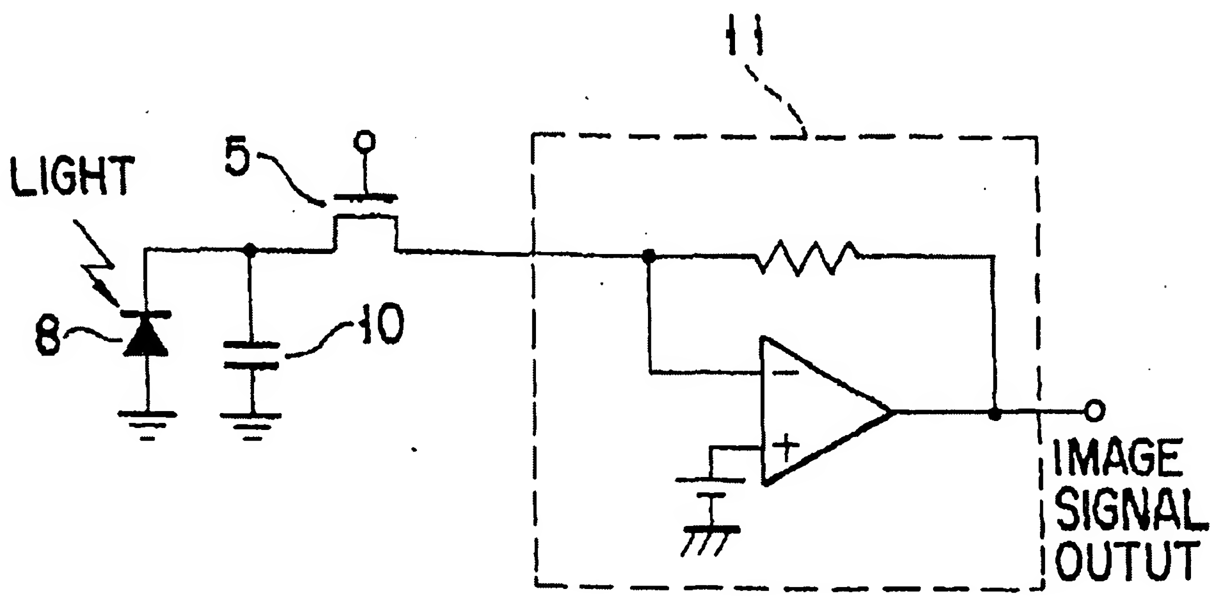
> the art at the time the invention was made to modify the device in Sonoda et al. and Nagasaki et al. by the teaching of Nelson et al. in order to provide a transimpedance amplifier which results in a conversion of current pulse into a corresponding voltage pulse (column 11, lines 27-36).

Pertinent portions of the Sonoda reference are discussed in detail in above.

Portions of the Nagasaki reference cited by the Examiner include the following:

> FIG. 16 shows an equivalent circuit of one pixel of a solid-state imaging device having such a structure. Drain electrode 7 of MOS transistor 5 is connected to output amplifier 11. This output amplifier 11 outputs a pixel signal made of the charge stored in the capacitor 10 of the pixel, out of an element, as an imaging signal by current-voltage conversion. *U.S. Patent No. 5,502,488 to Nagasaki et al., col. 6, lines 39-45.*

Fig. 16 of the Nagasaki reference is reproduced hereinbelow.



F I G. 16

Fig. 16 of the Nagasaki reference

Portions of the Nelson reference cited by the Examiner include the following:

> FIG. 3 shows an electrical diagram of circuit 50 for each of N channels. Circuit 50 is comprised of three combinations 51, 53, and 55 of circuit elements. First combination circuit 51 includes operational amplifier 52, which can be Burr-Brown OPA637, and feedback resistor 54, which can be 1.times.10.sup.7 ohms, connected in parallel with compensation capacitor 56, which can be 70 femto-farads. This combination of elements 51 serves as a trans-impedance amplifier which results in a conversion of current pulses into a corresponding voltage pulse.
>
> Fig. 3 of the Nelson reference is reproduced hereinbelow.

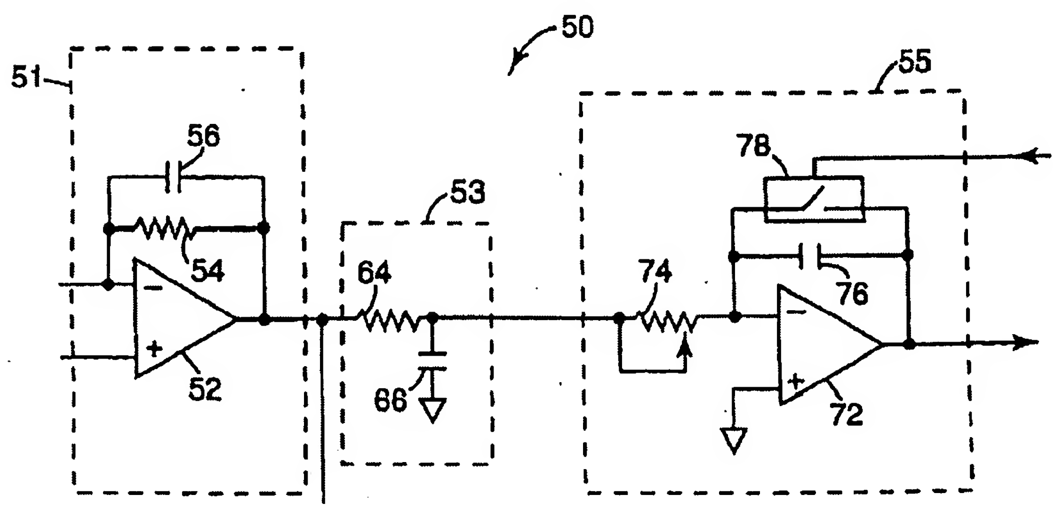


FIG. 3

Fig. 3 of the Nelson reference

Inspection of the above-cited portions of the Nagasaki and Nelson references, as well as other portions thereof, shows the following: The Nagasaki reference discloses a solid-state imaging device comprising a semiconductor substrate, where a plurality of pixels are formed thereon. Low impedance output amplifiers are provided for converting pixel signals to imaging signals, including amplifiers which include feedback resistors and positive and negative input terminals. The Nelson reference generally discloses an imaging system employing a photoconductive material capable of bearing a latent photostatic image, and more particularly discloses an operational amplifier 52 having a feedback resistor 54 connected in parallel with a compensation capacitor.

There is no discussion, hint at or suggestion in the Nagasaki or Nelson references regarding subtracting dark voltages from color signals where such dark voltages are based on measurements obtained at current operating temperatures at which a color sensing circuit is operating. Likewise, there is no discussion, hint at or suggestion in such references regarding fluctuations or variations of dark voltages with current operating temperatures, or compensating color signals for such fluctuations or variations. Indeed, neither the Nagasaki reference nor the Nelson reference discloses anything at all regarding dark currents, or any of the problems attendant to the presence of dark currents in image sensing systems or devices.

Referring to the Sonoda, Nagasaki and Nelson references, it becomes clear that none of those references discloses several of the elements and limitations set forth in required by all of claims 2, 3, 11 and 12 as amended herein relating to compensating an output signal provided by a color sensing circuit for current-operating- temperature-induced fluctuations or variations in the magnitudes of the dark currents associated therewith.

The Applicants have discovered that a certain novel combination of electrical, electronic and imaging components combined and configured in a certain order are required to produce the beneficial effects of the present invention. As demonstrated above, several of those components and configurations are neither disclosed nor suggested anywhere in the Sonoda, Nagasaki or Nelson references, alone or in combination, and accordingly cannot be prima facie obvious.

Merely asserting that "would be obvious to try" the invention by making reference to the subtraction of predetermined dark current values from color signals of Sonoda, the amplifier input configuration of Nagasaki, and the compensation capacitor configuration of Nelson, while essentially creating other claimed elements out of whole cloth without referring to any specific portions of the cited references to establish a motivation for combining elements or functionality disclosed therein, does not establish a *prima facie* case of obviousness.

There is no incentive, teaching or suggestion in the Sonoda, Nagasaki or Nelson references to produce the invention now recited in claims 2, 3, 11 and 12. The mere fact that the cited Sonoda, Nagasaki and Nelson references could, with the benefit of hindsight, produce something vaguely similar to the present invention does not make the modification obvious, or suggest the desirability of the modification required to arrive at the present invention. Indeed, this conclusion is buttressed by the fact that several elements and limitations are missing in the Sonoda, Nagasaki and Nelson references in respect of claims 2, 3, 11 and 12 as amended herein.

It is well settled that a motivation to combine elements or limitations disclosed in disparate references must be found within the references themselves or from pertinent sources of extrinsic information, and that such a motivation does not arise, as here, by merely identifying a collection of disparate piece parts in a combination of references, and then asserting it would have been obvious to take such disparate elements and limitations and add many others thereto to arrive at the presently claimed invention.

There is no suggestion of what direction any experimentation should follow in the Sonoda, Nagasaki and Nelson references to obtain the invention now recited in claims 2, 3, 11 and 12. Accordingly, the result effective variables, for example measuring variations in dark current induced by changes in current operating temperatures as those changes occur and compensating for such variations in real time in measured color intensity signals, are not known to be result effective. Thousands or millions of attempts at variations might be made before arriving at the desired improvement. Thus, to say that it would be obvious to read the Sonoda, Nagasaki and Nelson references and somehow arrive at the invention now recited in claims 2, 3, 11 and 12 is clearly not be the test for obviousness.

The foregoing analysis also makes it clear that there is no basis in the art for modifying the teachings of the Sonoda, Nagasaki and Nelson references to arrive at the invention now recited in claims 2, 3, 11 and 12. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some reason such as a teaching, suggestion or incentive supporting the combination. The Sonoda, Nagasaki and Nelson references do not teach the problems associated with compensating for variations in dark current induced by changes in ambient temperature in an imaging system.

When, as here, the prior art itself provides no apparent reason for one of ordinary skill in the art to make a modification or to combine references, an argument clearly does not exist that the claimed subject matter would have been obvious. Thus, an attempt to use the applicants' own disclosure as a blueprint to reconstruct in hindsight the invention now recited in claim as amended herein out of isolated teachings appearing in the prior art is clearly be improper.

The results and advantages produced by the invention set forth in claims 2, 3, 11 and 12 as amended herein, and of which the cited Sonoda, Nagasaki and Nelson references are devoid, cannot be ignored simply because the claim limitations might be deemed similar to the otherwise barren prior art.

The foregoing analysis also makes it clear that many limitations appearing in claims 2, 3, 11 and 12 as amended herein are not present in the Sonoda, Nagasaki and Nelson references. When evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. Under §103, the Examiner cannot in turn dissect claims 2, 3, 11 and 12 as amended herein, excise the various individual elements recited in the claims, and then declare the remaining portions of the mutilated claims to be unpatentable. The Examiner must follow the basic rule of claim interpretation of reading the claims as a whole. Accordingly, the Sonoda, Nagasaki and Nelson references may not properly be use as a basis for rejecting claims 2, 3, 11 and 12 as amended herein under §103.

Finally, the function, way and result provided by the devices and methods disclosed in the Sonoda, Nagasaki and Nelson references are completely different from those provided by the presently claimed invention. The devices disclosed in the Sonoda reference require that predetermined dark current values be estimated or determined, saved in a memory, and then subtracted from color signals. The temperature dependence of dark current is completely ignored in the Sonoda reference. In addition, dark current values employed in the Sonoda reference are based on estimates rather than actual values, and such estimates are not contemporaneous with any measurements of dark current. No dark currents are measured or otherwise evaluated in the Nagasaki or Nelson references. Thus, the devices and configurations employed in the Sonoda, Nagasaki and Nelson references, and the results provided by such devices and configurations disclosed in the Sonoda, Nagasaki and Nelson references have virtually nothing in common with those of the presently-claimed invention other than the fact that in one reference a non-contemporaneous estimate of dark current is employed. Such opposing functions, ways and results establish yet further that the presently-claimed invention is not *prima facie* obvious over the Sonoda reference in view of the Nagasaki reference, and further in view of the Nelson reference.

For all the foregoing reasons and more, claims 2, 3, 11 and 12 are not *prima facie* obvious over the Sonoda reference in view of the Nagasaki reference, and further in view of the Nelson reference.

(D) Claim 5 as amended herein is not unpatentable over the Sonoda reference under 35 U.S.C. 103(a).

In rejecting claim 5 as being unpatentable over the Sonoda reference under 35 U.S.C. 103(a), the Examiner stated:

> Regarding claim 5, Sonoda et al. fails to specifically disclose wherein said resistor value approximates a resistance of a feedback resistor in said color sensor circuit. However, Official Notice is taken that it is well known in the art to set the resistor value of a feedback resistor in a differential amplifier approximates resistance of a feedback resistor in a color sensor circuit in order to let the current signal stable. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by setting the resistor value of a feedback resistor in a differential amplifier approximates resistance of a feedback resistor in a color sensor circuit in order to let the current signal be stable.

Here at least a portion of the Examiner's findings respecting claim 5 are based on Official Notice. It is well settled that a mere statement that a particular claim limitation is design choice or that Official Notice is taken of same is not adequate. Instead, the Examiner ***must*** provide an explanation other than a mere conclusory statement as to why the difference between the cited prior art references and the invention set forth in claim 5 would have been obvious to one skilled in the art. In the event the rejection of claim 5 is maintained, Applicants' attorney respectfully requests the Examiner provide such an explanation.

While the Examiner is indeed correct that it is well known in the art to set a resistor value of a feedback resistor in a differential amplifier to approximate the resistance of a feedback resistor, such is not well known in the context of a color sensing circuit. Moreover, claim 5, which depends from claim 1 and which has been substantively amended herein to distinguish it over the Sonoda reference, now includes multiple limitations and elements that are nowhere to be found in the Sonoda reference. Thus, all the arguments set forth above regarding the lack of anticipation and unobviousness of claims 1-4, 6-16 and 18-21 also apply to claim 5 as amended herein, and thus claim 5 is not obvious over the Sonoda reference.

(E) Claim 17 as amended herein is not unpatentable over the Sonoda reference in view of the Nagasaki reference under 35 U.S.C. 103(a).

In rejecting claim 17 as being unpatentable over the Sonoda reference in view of the Nagasaki reference under 35 U.S.C. 103(a), the Examiner stated:

> Regarding claim 17, Sonoda et al. fails to disclose matching a resistor value for resistors in a differential amplifier circuit, to a resistance of a feedback resistor in a color sensor circuit configured to measure said first voltage, wherein said differential amplifier circuit is configured to receive said first voltage and said offset voltage and outputs said final voltage.
>
> However, Nagasaki et al. discloses a circuit of one pixel of a solid-state imaging device which comprises photodiode 8, the output of the photodiode 8 coupled to the negative input of amplifier 11, the input of the photodiode 8 coupled to ground; the positive input of amplifier 11 coupled to ground; the amplifier 11 includes a feedback resistor (figure 16, column 6, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by the teaching of Nagasaki et al. in order to provide a current-voltage converting circuit, which assures sufficient output voltage.

While the Examiner is indeed correct that it is well known in the art to match resistor and feedback resistor values in a differential amplifier, such is not well known in the context of a color sensing circuit. Moreover, claim 17, which depends from claim 16 which has been substantively amended herein to distinguish it over the Sonoda and Nagasaki references, now includes multiple limitations and elements that are nowhere to be found in the Sonoda reference.

Thus, all the arguments set forth above regarding the lack of anticipation and unobviousness of claims 1-16 and 18-21 also apply to claim 17as amended herein, and thus claim 17 is not obvious over the Sonoda and Nagasaki references.

V. Summary

Claims 1-21 as amended herein are pending in the present application, and are believed to be in condition for allowance. Examination of the application as amended is requested. The Examiner is respectfully requested to contact the undersigned by telephone or e-mail with any questions or comments he may have.

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By his attorney

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Date: Dec. 19, 2006

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